Concrete mixture design for hot weather: Experimental and statistical analyses

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Abstract: Factorial experimental design was adopted in this investigation to assess the combined effects of the following factors on workability and compressive strength: (a) water to cement ratio (W/C), (b) total aggregate to cement ratio (TA/C), (c) fine to total aggregate ratio (FA/TA), and (d) hot-weather conditions in terms of concrete mixture temperature at placement and curing conditions. The experimental data was thereafter subjected to regression analysis to develop reliable models for predicting workability in terms of the slump and compressive strength of a concrete mixture. Results of this study indicate that lowering the concrete mixture temperature at placement alone, as recommended in the codes of practice, does not eliminate the adverse effect of hot weather on compressive strength.